

REMARKS

Claims 27-32 were added in the response filed on March 24, 2006. Independent claim 27 is similar to claim 1 wherein "an emulsifier" has been added as a required ingredient to claim 27. Independent claim 27 is supported at least by original claim 2. Dependent claims 26-32, which depend on independent claim 27, find support at least in original claims 2-4. No new matter has been added. As discussed below, Applicants believe that original claims 1-7 distinguish over the single prior art reference cited by the Examiner. Claims 27-32 were added to even further distinguish over this reference.

Rejection Under 35 U.S.C. §103

The Examiner has rejected claims 1-7 and 27-32 under 103(a) as being obvious over U.S. Patent No. 5,750,177 to Yee et al. Applicants respectfully request reconsideration of the above-identified application in light of the following remarks.

Brief Explanation of Yee et al.

As specified in the pending application, Yee et al.^{1/} describe natural cheeses with increased whey protein having casein to whey ratios of 16:1 to 4:1 made from ultrafiltered cheese. Expressed in another way, **the cheeses of Yee et al. provide, at a minimum, 4 casein proteins to 1 whey protein.** The cheeses of Yee et al. require labor, time, and equipment-intensive ultrafiltered cheese, and result in cheese that has a casein to whey ratio that is no less than that of the starting milk.^{2/} Yee et al. reports that cow's milk has a casein to whey ratio of about 4:1 and that conventional cheeses have a casein to whey ratio of about 150:1 to about 40:1.^{3/}

^{1/} It is important to note that the present specification presents casein to whey ratios whereas Yee et al. provides whey to casein ratios. For the purpose of simplification and consistency, Applicants have converted the whey to casin ratios of Yee et al. to casein to whey ratios in both the original specification and throughout the present remarks.

^{2/}See the specification as originally filed at page 2, lines 1-5

^{3/}See Yee at al. at column 6, lines 3-10

Brief Explanation of the Present Application

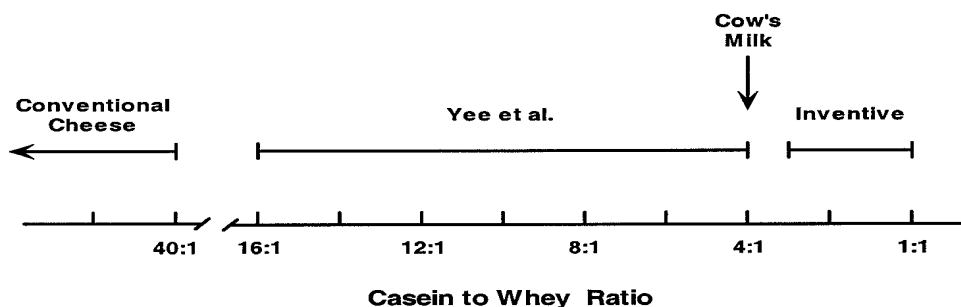
The present invention provides a process cheese having a casein to whey ratio of about 1:1 to about 3:1 (or 50:50 to 75:25 as expressed in claim 1). Expressed another way, the present application provides a process cheese having, at a minimum, one casein protein for one whey protein. **At the maximum, the present application provides a process cheese having three casein proteins for each whey protein.**

Yee et al. and the Present Application Differ as to the Ratio of Casein to Whey

As discussed above, Yee et al. provides a cheese having, at a minimum, a cheese having a larger number of casein proteins to whey proteins. The Examiner has admitted that the specific ratio of casein to whey provided in the pending application differs from the ratio of casein protein to whey protein provided in Yee et al.^{4/}

Diagrammatic Representation of the Differing Casein Protein to Whey Protein Ratios

Applicants present below a graphic representation and comparisons of the various casein to whey ratios for conventional cheese (i.e., 150:1 to 40:1), the cheese of Yee et al. (i.e., 16:1 to 4:1), and the inventive cheese (i.e., 1:1 to 3:1); for completeness, the casein to whey ratio of a typical cow's milk is also included.



^{4/}See the OA of 7/13/2005 at page 2

Thus, it is clear from this diagram that the cheese product of the present application has a significantly different ratio of casein to whey than does the cheese of Yee et al. or conventional cheese.

Yee et al. Does Not Provide a Method Capable of Producing the Casein to Whey Protein Ratio Provided in the Pending Application

Having established that Yee et al. and the pending application provide different casein to whey protein ratios, Applicants submit that Yee et al. could not produce a cheese having a casein to whey ratio as provided by the present invention. The process of Yee et al. utilizes ultrafiltration to retain whey proteins and casein proteins as naturally occurring in milk. As specified by Yee et al., “[m]ilk has a whey proteins to casein ratio of about 1:4.”^{5/} As is known, milk subjected to ultrafiltration will concentrate both whey proteins and casein proteins; however, the ratio of whey proteins to casein proteins does not change as a result of the ultrafiltration process. Yee et al. explains, “[t]he selective concentration of milk results in the formation of a retentate that contains both casein and whey proteins, in the same ratio as in the milk.”^{6/} Because Yee et al. uses ultrafiltration to retain whey and casein from milk, the ratio of whey proteins to casein proteins in the resultant cheese of Yee et al. can never be higher than the natural ratio of milk in a cheese product (i.e. 1:4).

The Examiner has previously rejected the above argument by stating in the Office Action of 3/7/06 that “neither Yee et al. nor the claimed invention are specifically directed to ultrafiltration.”^{7/} However, it is respectfully noted that the Examiner’s assertion is incorrect. Yee et al. specifically uses retentate from ultrafiltered milk in cheese to modify the casein to whey ratio of blends of natural cheese. Yee et al. specifically states:

^{5/}See Yee et al. at column 1, lines 14-15

^{6/}See Yee et al. at column 1, lines 32-35

^{7/} See the OA of 3/7/06 at page 3

The cheeses of the present invention will preferably have a whey proteins to casein ratio, by weight, of at least 1:16, and more preferably at least 1:8, which is generally equivalent to a cheese containing 2% whey proteins. **Where all of the whey proteins in the original milk are recovered in making a UF cheese, and only that cheese will have a whey proteins to casein ration of about 1:4.**^{8/} (emphasis added)

It is Not Obvious to Modify the Teachings of Yee et al.

The Examiner asserts that it would be obvious to modify the casein to whey ratio of the cheese provided by Yee et al. "because the manipulation of the casein to whey ratio is well-known in the art."^{9/} As Applicants have previously asserted, it is not obvious to modify the casein to whey ratio of the cheese provided by Yee et al. because ***Yee et al. uses methods that teach away from a process cheese having a casein to whey ratio of 1:1 to 3:1 as claimed in the invention.*** Yee et al. teaches away from the claimed invention because it is impossible to use the methods of Yee et al. to prepare the process cheese of the claimed invention.

Furthermore, the Examiner does not provide any reference showing the manipulation of casein to whey to a ratio of 1:1 to 3:1. The Examiner states, "In the absence of a showing to the contrary Applicant is using known components to obtain no more than expected results."^{10/} However, it is well established law that the mere fact that the prior art can be modified does not make the modification obvious, unless the prior art taught or suggested the desirability of the modification. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). The burden is on the Examiner to make a *prima facie* case of obviousness.

Yee et al. Fails to show Each and Every Limitation of the Claimed Invention

As discussed above, the Applicant strenuously urges that it would not be obvious to modify the casein to whey ratio of the cheese provided by Yee et al. to

^{8/} See Yee et al. at column 26, lines 4-11

^{9/} See OA of 3/7/06 at page 2

^{10/} See the OA of 3/7/06 at page 2

meet the limitations of the claimed invention. However, even if Yee et al. were modified to meet the casein to whey ratio of the claimed invention (which it should not be), still each and every limitation of the claimed invention is not taught by Yee et al.

Melting Point

Independent claims 1 and 27 specify that the melting point of the cheese having a "ratio of casein to whey protein of from about 50:50 to about 75:25" **must also have** "melting point of about 105 to about 150°F." As the Examiner has pointed out, Yee et al. provides natural cheeses with a "melting point of less 200°F." And, of course, the melting points required in the present claims clearly fall below 200°F. Nonetheless, Yee et al. clearly shows that as the amount of ultrafiltered cheese in their natural cheese/ultrafiltered cheese blends increases, the melting point also significantly increases. And of course, 100 percent ultrafiltered cheeses, which having a value of 4:1 casein to whey, most closely approach (but which still remain far from) the casein to whey protein ratios of the present invention, have the highest melting points.

Thus, one of ordinary skill in the art, if they even assumed that such cheeses having the casein to whey ratios of the present invention could be made, would have expected such cheeses to have even higher melting points, far from the melting points provided by the present invention and required by the present claims. See Yee et al., Tables 11-16.^{11/} The lowest melting temperature reported for any 100% ultrafiltered cheese sample in Yee et al. was 166°F (Table 12)^{12/}.

^{11/} Yee et al. reports the following melting temperature for 100% ultrafiltered (i.e., casein to whey ratios of 4:1) cheese samples as follows: 170°F (Table 11), 166°F (Table 12), > 230°F (Table 13), >230°F (Table 14), 186°F (Table 15), and 180°F (Table 16).

^{12/} Oddly, the ultrafiltered cheese used to make the blend was reported to have "Not melted at 230+°F" whereas the 100% ultrafiltered cheese blend (i.e., 0/100 blend) was reported to have a melting point of 166°F. Table 11 reports similar results. Whatever this inconsistency may mean, one of ordinary skill in the art would have still found similar trends (i.e., as the casein to whey ratio approaches the values in the present application, the melting point would be expected to increase).

The relevant data for Table 12 is reproduced below:

| Natural Cheese/ UF Cheese Blend | Melting Temperature (°F) | Casein/Whey Ratio* |
|------------------------------------|-----------------------------|--------------------|
| 80/20 | 143 | ~81:1 |
| 60/40 | 149 | ~62:1 |
| 40/60 | 146 | ~42:1 |
| 20/80 | 165 | ~23:1 |
| 0/100 | 166 | 4:1 |

* Casein/Whey ratios were estimated (except for the 0/100 blend) as a numerical average based on the relative amounts of the various cheeses in the blends using a casein/whey ratio for cheddar cheese of 100:1 (col. 6, lines 10-12) and a casein/whey ratio of the UF cheese as 4:1 (col. 26, lines 4-11) and assuming that the natural cheese and the UF cheese have roughly equal total amounts of casein + whey protein. Trends should remain similar even if the natural cheese and the UF cheese do not have equal total amounts of casein + whey protein.

The other tables of blends of natural cheese and ultrafiltered cheeses show similar trends. Thus, one of ordinary skill would expect, based on the teachings of Yee et al. that, even assuming cheeses having the casein to whey ratios of the present invention could be prepared, that they have even higher temperatures than the 4:1 casein/whey ratio ultrafiltered cheeses. Based on the teachings of Yee et al., one of ordinary skill in the art would have been surprised to find that it was possible, as provided by and claimed in the present invention, that process cheeses could be prepared having a casein to whey ratio of about 50:50 to about 75:25 as well as a “melting point of about 105 to about 150°F.”

Emulsifier

Claim 2 and claims 27 through 32 recite the inclusion of an emulsifier, which Yee et al. specifically excludes. See for example the abstract of Yee et al. “A cheese that contains high levels of whey proteins, **is free of emulsifying agents**, and yet has good melt properties is disclosed.” See also independent claims 1, 8, 10, 19, and 29 of Yee et al.


CONCLUSION

Applicants respectfully request that the Examiner allow pending claims 1-7 and claims 27-32 and pass this Application to issue.

If the Examiner believes that a telephonic or personal interview would be helpful to terminate any issues which may remain in the prosecution of the Application, the Examiner is requested to telephone Applicants' attorney, Richard Kaba, at the telephone number set forth below. The Commissioner is hereby authorized to charge any additional fees which may be required in the Application to Deposit Account No. 06-1135.

Respectfully submitted,
FITCH, EVEN, TABIN & FLANNERY

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